Department of Commerce $ National Oceanic & Atmospheric Administration $ National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-810
JANUARY 10, 2005

Operations and Services

Aviation Weather Services, NWSPD 10-8

AVIATION PRODUCTS

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SUMMARY OF REVISIONS: This directive supersedes NWSI 10-810, Domestic Products, dated December 20, 2002. Changes include:

The title is changed from Domestic Products to Aviation Products.

Removed WFO Guam from the list of offices in this directive because they no longer have Meteorological Watch Office (MWO) designation, and changed the title of section 7 to Meteorological Watch Office – Hawaii.

Added new products to the Aviation Weather Center's list in sections 3d and 3e.

Changed wording in section 5.a on Meteorological Impact Statement valid time to reflect it is valid up to 12 hours after issuance, which can be either immediately or up to two (2) hours in advance.

Deleted section 7.a.(5), Winds and Temperature Aloft Forecasts. These forecasts are now centrally produced for WFO Honolulu.

//SIGNED by Leroy Spayd// December 27, 2004
Dennis H. McCarthy Date
Acting Director, Office of Climate, Water, and Weather Services

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1. Purpose. This instruction lists National Weather Service (NWS) offices and the official aviation weather products they are responsible for issuing.

2. Background. There are several different levels of NWS offices under the administrative jurisdiction of regional headquarters which issue some type of forecast product. Technological advancements make it possible to develop graphical and/or textual products at each of these offices. However, in order to ensure the general public receives the highest level of quality while keeping spatial and temporal consistency, all national aviation products will be approved by the Director, Office of Climate, Water, and Weather Services before any level NWS office issues them as official.

3. Aviation Weather Center (AWC). The AWC is located in Kansas City, Missouri and operates under the supervision of the National Centers for Environmental Prediction. Along with being an NWS center, the AWC also doubles as a Meteorological Watch Office (MWO) for the International Civil Aviation Organization (ICAO).

The AWC issues the following products, some of which are covered in further detail in NWS Instruction (NWSI) 10-811, Enroute Forecasts and Advisories, in support of Federal Aviation Administration (FAA) air traffic controllers and the National Airspace System (NAS).

a. Airman's Meteorological Advisories (AIRMET) (Bulletin identifier - WA): AIRMET bulletins contain details of potentially hazardous conditions over the United States and adjacent waters. The continental U.S. portion is produced as six separate bulletins four times daily for designated geographical areas when one or more of the following conditions occurs, or is expected to occur, and affect an area of at least 3,000 square miles:

(1) Moderate icing
(2) Moderate turbulence
(3) Sustained surface wind of 30 knots or more
(4) Ceilings less than 1,000 feet and/or visibility less than three (3) miles affecting over 50 percent of an area at any one time
(5) Extensive mountain obscuration
(6) Nonconvective Low Level Wind Shear (LLWS) potential below 2,000 ft

b. Significant Meteorological Advisories (SIGMET): A SIGMET contains information on specified weather phenomena of an intensity and/or extent which concerns pilots and operators of all aircraft. When weather conditions meeting or exceeding criteria for SIGMET issuance occur or are expected to occur within two (2) hours, a SIGMET will be

issued. In the continental United States and coastal waters, SIGMETs have been separated into two classes, convective and nonconvective.

Convective SIGMETs (WST) concern only thunderstorms and related phenomena (tornadoes, heavy precipitation, hail, and high surface winds) and imply the associated occurrence of turbulence, icing, and convective LLWS. They are issued hourly and are valid for up to two (2) hours. Each hourly issuance supersedes and cancels the remainder of the previous issuance. Contained in each WST bulletin is an Outlook valid for the period from two (2) to six (6) hours after the issuance time of the bulletin.

Nonconvective SIGMETs (WS) are valid for up to four (4) hours and concern turbulence, icing, dust, sand, volcanic eruptions, or volcanic ash when of sufficient intensity and areal extent, usually defined as an area approximately one (1) latitude degree squared or approximately 3000 square miles. Exception: SIGMETs for mountain wave does not have to reach 3000 square miles.

c. Area Forecasts (FA): The FA provides an overview of weather conditions which could impact aviation operations over the Continental U.S. and adjacent waters. Therefore, it serves as a flight planning and weather briefing aid for general aviation (GA) pilots, and civil and military aviation operations. The continental U.S. portion is produced as six separate bulletins three times daily.

d. Graphics

(1) The Collaborative Convective Forecast Product (CCFP) provides a single convective forecast for strategic planning of en route aircraft operations within the NAS. A significant feature of the CCFP production process is the collaboration which occurs among meteorologists from the AWC, participating commercial airlines, Center Weather Service Units, and Meteorological Services Canada. The CCFP is issued every two hours and provides a 2-, 4-, and 6-hour forecast of convection. The CCFP aids in air traffic flow management decisions including the reduction of traffic delays, rerouting, and cancellations due to convective weather. The CCFP is also issued as a binary product.

(2) The Low Level Significant Weather (SIGWX) Forecast is a SIGWX forecast for the continental U.S, from surface to Flight Level (FL) 240, depicted as a snapshot for 12 and 24 hours. The chart combines forecasted weather features and precipitation produced by the Hydrometeorological Prediction Center in Camp Springs, Maryland with panels depicting significant weather and freezing levels produced at the AWC.

(3) The High Level SIGWX Forecast is provided for the enroute portion of international flights. The AWC provides a suite of High Level SIGWX forecast products for the World Area Forecast Center (WAFC) in Washington, D.C. These products are used directly by airline dispatchers for flight planning and weather briefing before departure, and by flight crew members during flight.

High level SIGWX charts are valid at specific fixed times: 0000, 0600, 1200, and 1800 UTC. They show significant en-route weather phenomena over a range of flight levels from 250 to 630, and associated surface weather features. The significant weather elements are defined by the World Meteorological Organization (WMO) and ICAO, and include:

(a) Thunderstorms and cumulonimbus clouds
(b) Tropical cyclones
(c) Severe squall lines
(d) Moderate or severe turbulence
(e) Moderate or severe icing
(f) Widespread sand storms and dust storms
(g) Well-defined surface convergence zones
(h) Surface fronts with speed and direction of movement
(i) Tropopause heights
(j) Jet Streams
(k) Volcanic eruptions

NOTE: The Low and High Level SIGWX are expected to change from graphical to binary in July 2005.

e. Binary

(1) The Graphical Turbulence Guidance (GTG) is an automatically-generated turbulence guidance forecast product which supplements AIRMETs and SIGMETs by identifying areas of turbulence. The GTG is not a substitute for turbulence information contained in AIRMETs and SIGMETs. It is authorized for operational use by meteorologists and dispatchers.

(2) The Forecast Icing Potential (FIP) is an automatically-generated guidance product which supplements AIRMETs and SIGMETs by identifying areas of forecast icing potential, but it does NOT substitute for intensity and forecast information contained in AIRMETs and SIGMETs. It is authorized for operational use by meteorologists and dispatchers.

(3) The Current Icing Potential (CIP) is an automatically-generated guidance product which supplements AIRMETs and SIGMETs by identifying areas of current icing potential, but it does NOT substitute for intensity and forecast information contained in AIRMETs and SIGMETs. It is authorized for operational use by meteorologists and dispatchers.

(4) The National Convective Weather Diagnostic and Forecast (NCWD/F) is an automatically generated depiction of: (a) current convection and (b) extrapolated significant current convection. It is a supplement to, but does NOT substitute for, the report and forecast information contained in Convective SIGMETs.

4. <u>Alaska Aviation Weather Unit (AAWU)</u>. The AAWU, located in Anchorage, Alaska

under the supervision of the NWS's Alaska Region, doubles as an ICAO MWO. They issue the following products, also covered in NWSI 10-811, for the airspace over the state of Alaska and adjacent coastal waters:

a. Text Forecasts

(1) SIGMETs: Issued when required for the Anchorage Flight Information Region (FIR).

(2) AIRMETs: Issued under three (3) separate WMO headers four (4) times daily for mainland and coastal Alaska. This includes AIRMETs in effect for each aviation zone.

(3) FAs: Issued under seven (7) separate WMO headers four (4) times daily for mainland and coastal Alaska, covering 25 zones. Each aviation zone forecast includes sections on clouds, weather, turbulence and icing. Some zones include forecasts for specific mountain passes. Zone forecasts include AIRMET and SIGMET information if applicable.

(4) Volcanic Ash Advisory (FV): Issued every six (6) hours when required for the Anchorage FIR and northeast Russia (north of 60N latitude and east of 150E longitude). FVs include information on volcanic eruptions, and current and forecast areas of volcanic ash.

(5) Volcanic Ash SIGMET: Issued whenever airborne volcanic ash threatens the Anchorage FIR.

b. Graphic Products

(1) Graphic Area Forecast: A six hour forecast containing a suite of four products:

(a) Surface Map and Weather
(b) Areas of Instrument Flight Rules (IFR) and Marginal Visual Flight Rules (MVFR) weather
(c) In-Flight icing and freezing levels
(d) Turbulence

These products are issued four (4) times daily, one hour after the issuance of the text area forecast (FA), and they cover all of Alaska, northwest Canada and extreme northeast Russia.

(2) Significant Weather (Low and Mid level - below FL250): Contains a suite of three forecast graphics (24, 36, 48 and 60 hours from model time). Each graphic includes surface map, areas of IFR and MVFR conditions, freezing level and areas of moderate or greater turbulence. It is issued two (2) times daily and covers all of Alaska, northwest Canada and extreme northeast Russia.

5. Center Weather Service Units (CWSU). CWSUs are joint FAA/NWS meteorological units directly supporting the FAA's 21 Air Route Traffic Control Centers (ARTCC). The products each CWSU issues are covered in NWSI 10-803, Support to Air Traffic Control Facilities, and support its respective ARTCC. These products are:

a. Meteorological Impact Statement (MIS): An unscheduled flow control and flight operations planning forecast. It is a forecast and briefing product for personnel at ARTCCs, the Air Traffic Control System Command Center in Herndon, Virginia, terminal radar approach control facilities and air traffic control towers responsible for making flow control-type decisions. The MIS is valid up to 12 hours after issuance time, detailing weather conditions expected to adversely impact air traffic flow in the CWSU area of responsibility. This includes being valid immediately for existing conditions when CWSU operations begin or for rapidly deteriorating conditions, or being valid up to two hours in advance of expected conditions. A MIS may be tailored to meet the unique requirements of the host ARTCC.

b. Center Weather Advisories: An aviation weather warning for conditions which either meet or approach national in-flight advisory (AIRMET, SIGMET or SIGMET for convection) criteria, or will adversely impact the safe flow of air traffic within the ARTCC's area of responsibility. It is primarily used by air crews to anticipate and avoid adverse weather conditions in the en route and terminal environments.

6. Weather Forecast Office (WFO). WFOs are multi-purpose, local level weather forecast centers which produce, among their suite of services, aviation-related products. These products may include:

a. Terminal Aerodrome Forecasts (TAF): The expected meteorological conditions significant to aviation at an airport (terminal) for a specified time period, usually 24 hours. The U.S. definition of a terminal is the area within five (5) statute miles of the center of an airport's runway complex. TAFs are covered in NWSI 10-813, Terminal Aerodrome Forecasts.

b. Transcribed Weather Broadcasts (TWEB): Valid for a 12-hour period, for routes and local vicinities describing specific information on sustained surface winds (25 knots or greater), visibility, weather and obstructions to vision, sky conditions (coverage and ceiling/cloud heights), mountain obscurement, and non-convective low-level wind shear. The routes are 50-nautical mile (NM) wide corridors (25 NM either side) along a line connecting the anchor points of the route, and a 25 NM radius semi-circle around the end points. The anchor and end points are TAF locations. TWEBs are covered in NWSI 10-805, Transcribed Weather Broadcasts.

c. Airport Weather Warnings (AWW): A forecast for weather phenomena which can adversely impact airport ground operations. This forecast is useful to airport managers, fix-based operators, airline ground personnel and others responsible for the safety of ground operations. The AWW is issued based on weather criteria specific to each airport, and may include the issuance of any NWS warning product which affects the airport (Five statute mile radius from the center of the airport complex). These criteria reflect local users' requirements, and are agreed upon between local airport management and the supporting WFO. Not all WFOs produce AWWs. AWWs are covered in NWSI 10-801, Airport Weather Warnings.

d. Soaring Forecasts: In areas where soaring or gliding are popular and Flight Service Stations have a high demand for soaring briefings, WFOs may produce a soaring forecast. The WFO is encouraged to use programs which automatically produce this information from sounding and model data, using as little manual input as possible, and it should be noted the data will not be updated until the next scheduled issuance. The soaring forecasts will only be produced for specified locations and times, and may be seasonal. Non-routine soaring forecasts will not be provided for special events such as soaring meets.

At a minimum, a soaring forecast should include winds and temperatures aloft (usually at customer-requested levels), stability indices, and aviation-related hazards. Soaring can differ in many parts of the U.S. Therefore, format or content which meets regional-specific customer needs may be added or modified through regional supplements to this directive.

7. Meteorological Watch Office (MWO) - Hawaii. WFO Honolulu is also designated as a MWO for ICAO. As a result of this unique designation, WFO Honolulu is the only WFO to issue certain products, all as text. These are:

a. SIGMETs: Issued when required for convection (including severe squall lines, hail, funnel clouds, and tornadoes), turbulence, icing, sandstorms/duststorms, tropical cyclones, mountain waves, waterspouts, and airborne volcanic ash.

b. AIRMETs: Issued for convection, turbulence, icing, mountain obscuration, Instrument Meteorological Conditions - clouds and/or visibility, nonconvective LLWS, and surface winds for 21 areas.

c. FAs: Each aviation zone forecast includes sections on clouds, weather, turbulence and icing. Zone forecasts include AIRMET and SIGMET information if applicable.

d. Route Forecasts (ROFOR): Coded ROFORs for regularly scheduled flights across portions of the Pacific Ocean. They also may be prepared upon special request.

All products issued by WFO Honolulu are covered in further detail in NWSI 10-811.